Remarks

In the specification, an abstract has been added in accordance with 37 CFR 1.72(b). To assist the Office, a copy of the Abstract on a separate page is provided after the last page of this response.

Claims 1-14, 24-31, 33 and 38-39 have been cancelled. Claims 15-23, 32 and 34-37 have been cancelled, in accordance with an earlier restriction requirement. In view of the Examiner's earlier restriction requirement, Applicants reserves the right to present the subject matter of claims 15-23, 32 and 34-37 in a divisional application. Claims 40-77 are new. No new matter is introduced by these amendments.

After entry of this amendment, claims 40-77 are pending in the application.

Telephonic Interview

The Applicants thank the Examiner for her helpful comments and advice given to their representative Brian Kingwell by telephone on December 1, 2003. Sequence identity was discussed. It is believed that this response has been prepared in accord with the Examiner's comments and advice.

Rejections Under 35 U.S.C. § 112

The specification is objected to and the claims rejected under 35 U.S.C. § 112 on the basis, that "KCS2" could refer to something other than a long chain fatty acid biosynthetic enzyme and is therefore indefinite. New claims 40-42 and 58-60 overcome this objection by referring to the specific sequence in *Arabidopsis KCS2* that is claimed, i.e. position 1046-2509 of SEQ ID NO:1.

The Examiner objected to the term "heterologous" as being indefinite. Page 6, line 13 of the specification defines "heterologous" in reference to nucleic acids as "a nucleotide sequence which is ligated to, or is manipulated to become ligated to, a nucleic acid sequence to which it is not ligated in nature, or to which it is ligated at a different location in nature. The term

"heterologous" therefore indicates that the nucleic acid molecule has been manipulated using genetic engineering, i.e. by human intervention." In claim 40, this term is used in combination with the term "recombinant," which is defined at page 6, line 8 as meaning, in relation to nucleic acids, nucleic acid sequences that are joined together by means of molecular biological techniques. Therefore, by "heterologous" it is clear that the Applicants mean that the claimed sequences are introduced by recombinant techniques to form recombinant constructs. In view of the foregoing, it is the Applicants' submission that the term "heterologous" is not indefinite.

The Examiner objected to the previous claims, alleging that they did not conform to the written description requirement and that the description was not sufficiently enabling. While traversing this objection and maintaining the assertion of patentability of the previously claimed subject matter, to expedite prosecution it is submitted that the clams as amended meet these requirements.

Applicants respectfully request that the Examiner not renew claim rejections under 35 U.S.C. § 112.

Rejections Under 35 U.S.C. § 101

New claims 43-52 and 63-72 are directed to transgenic plants and seeds comprising the sequences of the invention. The term "transgenic" is discussed at page 15, line 5-14. The term defines a plant as transgenic if it has been altered using recombinant techniques with a foreign nucleic acid, or is progeny of such a plant containing the foreign nucleic acid. Therefore, if through Mendelian inheritance a seed of a transgenic plant does not contain the foreign sequence, then the seed would not be considered transgenic and would not be encompassed by the claims.

Rejections Under 35 U.S.C. § 102

It is respectfully submitted that the claims as amended overcome the objections under 35 U.S.C. § 102 by claiming at least 95% homology to position 1046-2509 of SEQ ID NO:1. Metz, *et al.* does not anticipate the claimed sequences.

Applicants respectfully request that a timely Notice of Allowance be issued in this case. If any matters remain to be discussed prior to such examination, the Examiner is invited to call the undersigned at the telephone number listed below.

Respectfully submitted,

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A PLANT LONG CHAIN FATTY ACID BIOSYNTHETIC ENZYME

ABSTRACT

In various aspects, the present invention provides nucleic acid sequence encoding all or part of a new plant long chain fatty acid condensing enzyme (a fatty acid elongase), designated herein as KCS2 (for beta-ketoacyl-coenzyme A synthase 2). In some embodiments, KCS2 may mediate the biosynthesis of C18, C20, C22 and C24 fatty acids. The activity of the enzyme is typically characterized by two carbon (malonyl-CoA) additions to C16, C18, C20 and C22 moieties (C16-C22 acyl CoA molecules), i.e. condensation of malonyl-CoA with a C16, C18, C20 or C22 acyl-CoA. The fatty acids produced by the enzyme may for example be saturated 18:0, 20:0, 22:0 and 24:0 fatty acids. The invention includes recombinant nucleic acid molecules comprising a heterologous nucleic acid coding sequence encoding the plant long chain fatty acid condensing enzyme.